Original Research Article

Digital finance and corporate green innovation

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Abstract: The rapid development of digital finance is profoundly affecting various industries, in which the promotion of green innovation for enterprises is particularly significant. The purpose of this paper is to explore how digital finance can promote enterprises' innovation in green technology and products by enhancing financing efficiency, optimizing resource allocation, promoting information transparency and other channels. By sorting out the relevant theoretical foundations and combining with typical case studies, this paper systematically elaborates the intrinsic mechanism between digital finance and corporate green innovation, and puts forward corresponding policy recommendations.

Keywords: Digital finance; Green innovation; Financing efficiency; Resource allocation; Environmental sustainability

1. Introduction

With the increasingly serious problem of global climate change, how to realize economic growth while protecting the ecological environment has become a focus of attention for all countries. Green innovation, as a solution that balances economic and environmental benefits, is highly valued by enterprises and governments. However, green innovation often involves high capital investment and a long return cycle, which poses a greater challenge to the financing ability of enterprises. In this context, the development of digital finance provides new financing channels and innovation momentum for green innovation.

2. Theoretical foundations of digital finance and corporate green innovation

2.1. Connotation and characteristics of digital finance

Digital finance refers to the provision of more efficient and convenient financial services to enterprises and individuals through digital technology and Internet platforms. Its main features include:

Efficiency: Digital finance utilizes technologies such as big data, artificial intelligence, and blockchain to optimize the information processing process and risk assessment mechanism, reduce information asymmetry, and significantly improve the efficiency of fund matching.Inclusiveness: Digital finance breaks through the geographical and scale limitations of traditional finance, enabling more small and medium-sized enterprises (SMEs) to have access to financing opportunities.

Transparency: with the popularization of digital technology, financial information disclosure has become more transparent, which can effectively reduce the cost and risk of financial transactions and provide more predictable financial support for green innovation projects.

2.2. The Connotation of green innovation in enterprises

Enterprise green innovation refers to the enterprise's innovation in products, technology, production processes and other aspects to reduce resource consumption, reduce environmental pollution and realize sustainable development. According to the content of innovation, green innovation can be divided into:

Product Green Innovation: Develop environmentally friendly products or services to meet market demand.

Technological green innovation: Adoption of cleaner production technologies to improve resource utilization efficiency.

Institutional green innovation: optimize the enterprise management system and promote green transformation.

3. Analysis of the mechanism of digital finance for promoting green innovation of enterprises

3.1. Enhancing financing efficiency and alleviating financial constraints

Green innovation often faces high financing thresholds, especially in a capital-scarce environment, where traditional financing channels often fail to meet the financial needs of enterprises. Digital finance reduces information asymmetry and improves financing efficiency through technologies such as Internet platforms, big data and artificial intelligence, which in turn alleviates the financial constraints of enterprises Green innovations often face high capital needs and large financing risks, and digital finance effectively alleviates this problem through multi-channel means:

Financing support from Internet financial platforms: digital financial platforms help SMEs break through the financing threshold of traditional finance and expand their sources of funding through the aggregation of funds from many investors.

Big Data and Artificial Intelligence Risk Control: Through big data analytics and artificial intelligence technology, digital finance can accurately assess a company's environmental performance and operational status, thereby reducing information asymmetry and improving financing efficiency.

3.2. Optimize resource allocation and promote capital flows to green projects

The advantages of digital finance in resource allocation can help direct capital to environmentally friendly projects and drive companies towards green transformation:

Smart Contracts for Funds Use Regulation: By introducing smart contract technology, Digital Finance is able to automatically monitor and control the flow of funds to ensure that they are used for green innovation projects.

Green Crowdfunding and Public Participation: The crowdfunding model on digital financial platforms not only provides financial support for green projects, but also enhances the public's environmental awareness and participation.

Expansion of the green bond market: Digital financial technology has facilitated the issuance and trading of green bonds, increasing the capital market's attention and commitment to green projects.

3.3. Promoting information transparency and reducing green innovation risks

Digital finance reduces the uncertainty of green innovation projects by increasing information transparency, which in turn promotes capital market confidence in green projects:

Information Transparency of Blockchain Technology: Traceability and anti-tampering of fund flow is realized through blockchain technology, which improves the transparency and credibility of the use of funds.

Environmental information disclosure and market recognition: Digital financial platforms have strengthened the disclosure mechanism of corporate environmental information, which helps to increase market recognition of

corporate green performance and willingness to invest.

4. Typical case study: Practical exploration of digital finance and green innovation

4.1. Ant financial's green finance practice

As China's leading digital financial platform, Ant Financial Services has been actively exploring the promotion of green finance. Through its "Sesame Credit" and "Ant Forest" platforms, Ant provides green financing support for enterprises. The "Ant Forest" is a program that accumulates energy and converts it into carbon emissions reduction through environmental behavior, which not only encourages users to participate in environmental protection through daily actions, but also provides a source of funding for green projects. The successful operation of this platform provides enterprises with channels for green loans and environmental project financing, especially for small and medium-sized enterprises (SMEs) that participate in environmental projects and carry out green innovations, and Ant Financial Services accurately evaluates the green credit and environmental performance of the enterprises and provides them with financing support through its big data and artificial intelligence technology.

4.2. BOF's green innovation support

As a well-known digital financial platform in China, Jingdong Finance utilizes its powerful big data analysis capabilities to provide enterprises with green innovation financing support. Jingdong Finance helps enterprises identify green innovation projects and assess their feasibility and potential returns through big data and artificial intelligence technology. The platform not only helps enterprises obtain traditional loan financing, but also innovatively introduces products such as green bonds and green finance leasing, which are specifically designed to provide financial support for environmentally friendly enterprises and green innovation projects.

Jingdong Finance's green financing services cover a wide range of fields, including new energy, environmentally friendly materials, and energy-saving technologies. Through digital financial tools, Jingdong Finance not only improves the efficiency of capital flow, but also optimizes the allocation of capital so that more green projects can obtain the capital they need. With the help of big data analysis, Jingdong Finance also provides enterprises with market demand forecasts and technical risk assessments for green innovation projects, helping them avoid potential investment risks and ensuring that funds can be efficiently invested in innovative projects with actual green benefits.

4.3. Green financial services of ping an bank

Ping An Bank provides enterprises with diversified green financial services through digital technology, helping them realize green transformation. Ping An Bank's "Green Credit Product" is a typical example of its digital finance supporting green innovation. The product offers favorable financing terms to enterprises that meet environmental standards, especially those committed to green technology research and development and environmental protection. Through its digital platform, Ping An Bank provides enterprises with a fast credit assessment and loan approval process, which greatly improves the efficiency of access to capital.

5. Challenges of digital finance for corporate green innovation

5.1. Information security and privacy protection

1. With the widespread use of digital finance, the issues of information security and privacy protection have

become increasingly prominent. Digital finance relies on the collection, processing and transmission of a large amount of data, including business data, environmental performance, credit records and so on. Such sensitive information, if not effectively protected, may be at risk of leakage, misuse or cyber-attack. For enterprises, any data leakage involving environmental investment and green innovation projects may lead to a decline in market trust, thus affecting their ability to raise funds and their innovation process.

5.2. Policy regulation and market stabilization

While innovations in digital finance could help promote green innovation, the digital finance market could face regulatory lags and inconsistencies, as the relevant policy and regulatory systems were not yet fully developed. While the traditional financial regulatory system is mainly based on traditional financial products and trading practices, the development of digital finance is often beyond the scope of the traditional regulatory framework, which puts a lot of pressure on regulators.

5.3. Imbalance between technology and resources

While the application of digital finance provides SMEs with more access to finance, there is still an imbalance in the distribution of technology and resources. Many enterprises that are more technologically backward and lack digital infrastructure, especially some small and medium-sized enterprises (SMEs), may not be able to take full advantage of digital finance tools. These enterprises may not be able to access digital finance platforms or the financing facilities they offer due to a lack of digital management capacity or information technology infrastructure.

6. Policy recommendations

6.1. Strengthening digital financial infrastructure

In order to enable more enterprises to enjoy the convenience of digital finance, governments should increase their investment in and construction of digital financial infrastructure, especially in remote areas and places with a high concentration of small and medium-sized enterprises (SMEs). The accessibility and inclusiveness of financial services can be effectively enhanced by improving network infrastructure and increasing the penetration of fintech services.

6.2. Improving the digital financial regulatory system

Jian With the rapid development of digital finance, the traditional financial regulatory framework is facing great challenges. In order to ensure the healthy and orderly development of digital finance, regulators need to improve the regulatory system and formulate more flexible and detailed regulations in accordance with the characteristics of digital finance.

6.3. Encouraging green financial innovation

Introduce incentive policies to encourage financial institutions to develop more green financial products and support enterprises in green innovation.

6.4. Enhancement of enterprise digitalization capabilities

Strengthening technical and managerial support for small and medium-sized enterprises (SMEs) to help them better utilize digital financial tools to promote green development.

7. Conclusion

Digital finance has shown great potential in promoting green innovation among enterprises. By enhancing financing efficiency, optimizing resource allocation and promoting information transparency, digital finance not only eases the financing constraints of enterprises, but also strengthens market confidence in green innovation. However, the development of digital finance also faces challenges in terms of information security and policy regulation. In the future, the relevant system should be further improved to give full play to the positive role of digital finance in green innovation and realize the win-win situation of economic growth and environmentally sustainable development.

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